

WHAT IS CLAIMED IS:

1. A method for manufacturing a MOS varactor, comprising the steps of:

5 forming a device isolation film on a semiconductor substrate;

 depositing a gate oxide film and a first polysilicon after the formation of the device isolation film;

 patterning the resultant material and etching the first
10 polysilicon and the gate oxide film to form a transistor gate;

 coating the entire resultant material with a photoresist film, then opening a varactor forming region and then forming a varactor oxide film of a high dielectric material;

 depositing the second polysilicon and then patterning the
15 same to form a varactor gate; and

 removing the photoersist film of the transistor forming region and then proceeding to the following process.

2. A method for manufacturing a MOS varactor, comprising the steps of:

forming a device isolation film on a semiconductor substrate;

5 forming a varactor oxide film of a high dielectric material over the entire surface of the resultant material and then removing the regions except for the varactor to pattern the same;

depositing a gate oxide film and a polysilicon on the entire
10 surface of the resultant material and implanting ions in accordance with an MOS type; and

patterning the polysilicon by a mask, patterning the transistor gate and the varactor gate and then proceeding to the following process.

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3. The method of claim 1, wherein the varactor oxide film is selected from the group consisting of Al_2O_3 , Ta_2O_5 , HfO_2 , ZrO_2 , HfON , BST and TiO_2 .

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4. The method of claim 1, wherein the varactor oxide film is deposited at less than 400°C by a deposition technique selected from the group consisting of ALD , PEALD and MOCVD .

5. The method of claim 2, wherein the varactor oxide film is selected from the group consisting of Al_2O_3 , Ta_2O_5 , HfO_2 , ZrO_2 , HfON , BST and TiO_2 .

5 6. The method of claim 2, wherein the varactor oxide film is deposited at less than 400°C by a deposition technique selected from the group consisting of ALD, PEALD and MOCVD.